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#10

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/429,295	10/28/99	BROWN	S 10196-1-(125

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EXXONMOBIL CHEMICAL COMPANY
P O BOX 2149
BAYTOWN TX 77522-2149

EXAMINER

PREISCH, N

ART UNIT	PAPER NUMBER
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1764

DATE MAILED:

08/15/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.

09/429,295

Applicant(s)

Brown et al.

Examiner

Nadine Preisch

Group Art Unit

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☒ Responsive to communication(s) filed on Oct 28, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-10 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-10 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Claim Rejections - 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2,4,5,8, and 9 rejected under 35 U.S.C. 102(b) as being anticipated by Wilms et al. (4,098,839).

Applicants are claiming an oligomerization process which involves contacting a hydrocarbon feedstock with a hydrotreating catalyst in the absence of hydrogen. The dependent claims contain limitations directed at specific catalyst combinations and process conditions.

The reference of Wilms et al. (4,098,839) discloses a process for the oligomerization of unsaturated hydrocarbons. See column 1, lines 6-11. The process involves contacting a catalyst with the feed under conditions including 80 – 180 °C (176-358 °F), a pressure of 200-1500 psig and a weight hourly space velocity (WHSV) of 0.8 to 2.5. See column 3, lines 42-45. Wilms et al. (4,098,839) discloses a catalyst containing an alumina support, molybdenum and one or more members from the group including cobalt and nickel. See column 2, lines 35-40 and 45-50. Wilms et al. (4,098,839) teaches that the catalyst composite is catalytically activated in an oxidizing atmosphere such as air or oxygen. See column 2, lines 60-65. The reference further

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teaches that the metals in the catalyst are converted to the oxide form. See column 3, lines 1-10. The reference discloses a specific example with cobalt oxide (CoO) and molybdenum oxide (MoO₃) on alumina. See column 4, lines 6-9. The catalysts can be used in a "liquid" phase process. See column 3, lines 53-54.

The reference of Wilms et al. (4,098,839) succeeds at disclosing a process for oligomerizing a hydrocarbon feedstock with a catalyst corresponding to applicants' mixed oxide catalyst, including an embodiment with mixed cobalt and molybdenum oxide on alumina. Since the reference does not disclose the use of hydrogen in the oligomerization reaction zone, it is considered to disclose an oligomerization in the absence of hydrogen.

Applicants' process is anticipated by the reference of Wilms et al.(4,098,839) because it discloses a process employing essentially the same feed contacting step and catalyst claimed by applicants.

Claim Rejections - 35 U.S.C. § 102

Claims 1, 2, 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Barnett et al.(4,628,138).

The reference of Barnett et al.(4,628,138) discloses a process for the oligomerization of a hydrocarbon in the form of ethylene. See column 1, lines 6-8. The process involves the use of a heterogeneous catalyst in the form of a supported nickel/metal oxide promoter composition. See column 1, lines 64-67, column 7, lines 63-66 and column 2, lines 9-12. Barnett et al.(4,628,138)

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discloses an embodiment where the reaction is conducted in the liquid phase. See column 5, lines 39-41.

The reference of Barnett et al.(4,628,138) succeeds in disclosing a liquid phase hydrocarbon oligomerization in the presence of a "heterogeneous" catalyst. In addition, the reference succeeds in disclosing a supported heterogeneous catalyst corresponding to that defined by the limitations in applicants' claims 6 and 7. Since the reference does not disclose the use of hydrogen in the oligomerization reaction zone, it is considered to disclose an oligomerization in the absence of hydrogen.

Applicants' process is anticipated by the reference of Barnett et al.(4,628,138) because it discloses an oligomerization utilizing essentially the same heterogeneous catalyst claimed by applicants.

Claim Rejections - 35 U.S.C. § 102 (b)/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hepp (2,558,137).

Applicants are claiming an oligomerization process which involves contacting a hydrocarbon feedstock with a catalyst in the absence of hydrogen. Applicants further claim that the feedstock contains sulfur-containing molecules which are oligomerized.

The reference of Hepp (2,558,137) discloses a process for the treatment of a sulfur containing feed. See column 1, lines 1-5. The process involves the oligomerization of olefins in the presence of a catalyst. See column 4, lines 11-55. The process involves converting sulfur containing compounds to higher boiling point sulfur compounds. See column 2, lines 56-60. The reference teaches that an olefin is reacted with a sulfur compound to form a higher boiling point sulfur compound. See column 3, lines 16-21.

The reference of Hepp (2,558,137) succeeds at disclosing a process for oligomerizing a hydrocarbon feedstock which contains sulfur compounds in the presence of a catalyst. Since the reference does not disclose the use of hydrogen in the oligomerization reaction zone, it is considered to disclose an oligomerization in the absence of hydrogen.

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It is noted that the reference is silent about the "oligomerization" of the sulfur containing compound. However, the oligomerization of the sulfur containing compound is considered to inherently occur because a higher boiling point sulfur compound is produced which is a combination of an olefin and the original sulfur containing compound.

Applicants' process is anticipated by the reference of Hepp (2,558,137) because it discloses essentially the same hydrocarbon/sulfur feed contacting step claimed by applicants.

In addition, the presently claimed sulfur-containing molecule oligomerization would obviously have been provided as a result of the operation of the Hepp (2,558,137) process.

Claim Rejections - 35 U.S.C. § 103

Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suggitt et al.(3,717,586).

The reference of Suggitt et al.(3,717,586) discloses a process for polymerizing (polymerizing =oligomerizing) hydrocarbons in the form of olefins. See column 5, lines 14-16. The process involves contacting the feed with a catalyst containing an alumina support and a metal component such as nickel and/or molybdenum. See column 2, lines 25-32 and 47-54.

Suggitt et al.(3,717,586) succeeds at disclosing a process for the polymerization of a hydrocarbon. Since the reference does not limit the type of polymerization, it is considered to encompass polymerizations involving small numbers of monomers, such as oligomerizations. Suggitt et al.(3,717,586) also succeeds at disclosing catalyst components corresponding to

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applicants' nickel, molybdenum and alumina components. Furthermore, the reference does not disclose the use of hydrogen in the reaction zone. As a result, it is considered to disclose a polymerization in the absence of hydrogen.

Several differences are noted between the reference of Suggitt et al.(3,717,586) and applicants' claimed invention. The reference is silent about the phase of the reactants during the conversion. In addition, Suggitt et al.(3,717,586) does not disclose the specific combination of nickel and molybdenum on alumina.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to practice the Suggitt et al.(3,717,586) process in any phase which would accomplish the desired conversion, including the liquid phase, because the reference does not limit the phase condition of the reactants. In the absence of unexpected results, it would appear that any phase conditions which allow for the contact of the feed and catalyst would be suitable to accomplish the disclosed reaction.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select any combination of disclosed metal components in the Suggitt et al.(3,717,586) catalyst, including applicants' specific NiMo/alumina combination, because the reference does not limit the metal combinations. In the absence of unexpected results, any combination of disclosed metals would be expected to perform similarly.

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Prior Art of Record

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

The attached references are cited to show the relative state of the art with respect to oligomerizing hydrocarbons in the presence of catalysts with components similar to those claimed by applicants.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Preisch whose telephone number is (703) 305-2667. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

August 11, 2000
N.P.

N.P.

**NADINE PREISCH
ART UNIT 1764**

Nadine Preisch